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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,098	12/21/2005	Takashi Ito	9369-114US (T37-196236C)	8148
570 7590 08/12/2009 PANITCH SCHWARZE BELISARIO & NADEL LLP ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103			EXAMINER EOFF, ANCA	
			ART UNIT 1795	PAPER NUMBER
			MAIL DATE 08/12/2009	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/562,098	<b>Applicant(s)</b> ITO ET AL.	
	<b>Examiner</b> ANCA EOFF	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 7-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 7-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1 and 7-10 are pending in the application. Claims 2-6 have been cancelled.
2. The foreign priority document JP 2003-180470, filed on June 25, 2003 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.

### ***Continued Examination Under 37 CFR 1.114***

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 12, 2009 has been entered.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. Claims 1 and 9-10 are rejected under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158).

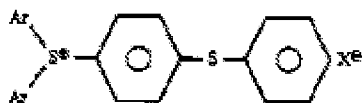
With regard to claims 1 and 10, Ohkuma et al. disclose a photosensitive composition containing a radical-polymerizable monomer, a cationic-polymerizable monomer, a radical polymerization initiator and a cationic-polymerization initiator (abstract).

The radical-polymerizable monomer may be a monomer with (meth)acrylate groups (column 3, lines 17-48).

The cationic-polymerizable monomer may be a monomer with epoxy groups (see examples in columns 5-6).

The radical-polymerization initiator may be a compound exhibiting effective light absorbtion in UV region (column 8, lines 58-60).

The cationic-polymerization initiator may be represented by the formula (I):



(I) (column 10, lines 1-10), wherein Ar is an aryl group and X<sup>+</sup> may be SbF<sub>6</sub><sup>+</sup> (column 10, lines 23-24).

The specific examples in the specification show cationic-polymerization initiators wherein Ar is a phenyl group (see Examples 1-3 and 5-8 in columns 12-15).

The compound (I) having as Ar a phenyl group and as X<sup>+</sup> a SbF<sub>6</sub><sup>+</sup> anion is equivalent to the compound of formula (I) of the instant application.

While Okhuma et al. do not specifically teach the compound of formula (I) of the instant application, it would have been obvious to one of ordinary skill in the art at the time of the invention to obtain it, based on the teachings of Okhuma et al. regarding the compound (I) above, the examples of anions  $X^-$  and the examples wherein Ar is a phenyl group.

However, Ohkuma et al. do not teach the purity of the cationic-polymerization initiator of formula (I), as required by the instant application.

Date et al. disclose a method of manufacturing sulfonium salts used as photocationic polymerization initiators for resists (par.0045).

In Example 5, Date et al. disclose the synthesis of (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% (par.0063-0065). It is not explicitly specified that (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate is synthesized in Example 5 but the ingredients are the same as for Example 2 which leads to (4-phenylthiophenyl) diphenylsulfonium hexafluorophosphate except that potassium hexafluoroantimonate replaces potassium hexafluorophosphate. Date et al. further disclose that  $^{13}\text{C}$ -NMR analysis and IR analysis indicated that the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate comprises small amount of raw materials diphenyl sulfoxide, diphenyl sulfide(par.0052-0053 and par.0063-0064).

It is the examiner's position that there is no compound represented by formula (II) of the instant application in the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate of Example 5 of Date et al. Therefore the limitations of claims 1 and 10 for the quantity of compound of formula (II) are met.

It would have been obvious for one of ordinary skill in the art to use the (4-phenylthiophenyl) diphenylsulfonium hexafluoroantimonate with a purity of 99% obtained in the process of Date et al. as photocationic polymerization initiators in the composition of Ohkuma et al., since Date et al. specifically indicate this use for the high-purity sulfonium salts (Date et al., par.0045 and par.0062).

With regard to claim 9, Date et al. disclose the synthesis of (4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate in Example 5 (par.0063-0065). The purity of the compound is more than 99% so raw materials are comprised in an amount of less than 1% (par.0064 shows that raw materials are the impurities found in the compound).

The raw materials for the synthesis of (4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate comprise about 30% diphenylsulfoxide (Examples 2 and 5 in par.0052-0053 and par.0063). Therefore, it would be expected that the mixture of raw materials left as residues in the (4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate would comprise 30% diphenylsulfoxide.

The (4-phenylthiophenyl)diphenylsulfonium hexafluoroantimonate obtained in Example 5 would comprise less than 0.3% of diphenylsulfoxide, which encompasses the range claimed in claim 9 of the instant application.

6. Claims 7-8 are rejected under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are

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from the English equivalent document, US Pg-Pub 2004/0030158) as applied to claim 1 and in further view of Steinmann (US Pg-Pub 2004/0137368).

With regard to claims 7-8, Ohkuma modified by Date teach the composition of claim 1 (see paragraph 5 of the Office Action) but Ohkuma and Date fail to disclose that the composition further comprises an oxetane compound and a polyalkylene ether compound.

Steinmann discloses a radiation-curable composition comprising:

- (A) at least one cationically polymerizing organic substance;
- (B) at least one free-radical polymerizing organic substance;
- (C) at least one cationic polymerization initiator;
- (D) at least one free-radical polymerization initiator (par.0023-0027).
- (E) at least one hydroxyl-functional compound (par.0028)
- (F) at least one hydroxyl-functional oxetane compound (par.0029).

The preferred compound (F) is 3-ethyl-3-hydroxymethyl-oxetane (par.0110)

In Example 1 (table 2, par.0151), Steinmann specifically discloses that 3-ethyl-3-hydroxymethyl-oxetane (Cyracure UVR 6000, in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 26.78 wt.% with respect to the 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

Steinmann discloses that the one hydroxyl-functional compound (E) (par.0023-par.0028) may be polypropylene glycols of various molecular weights (par.0094), glycerine propoxylated polyether triol and polyethyleneglycols (par.0103). These

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compounds are equivalent to the polyalkylene ether compounds of the instant application.

In Example 1 (table 2, par.0151), Steinmann specifically discloses that glycerine propoxylated polyether triol (Voranol CP 450 in table 1, par.0143) is comprised in the radiation-curable composition at a ratio of 17.85 wt.% with respect to 3,4-epoxycyclohexylmethyl-3',4'-epoxycyclohexane carboxylate (Cyracure UVR 6110, in table 1, par.0143).

The composition of Steinmann et al. gives exceptionally high photospeed, has low viscosity, low humidity sensitivity and high temperature resistance (par.0002).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add a at least one hydroxyl-functional compound, such as polypropylene glycols of various molecular weights, glycerine propoxylated polyether triol and polyethyleneglycols and at least one hydroxyl-functional oxetane compound , as disclosed by Steinmann, to the composition of Ohkuma modified by Date, in order to obtain a composition with exceptionally high photospeed, has low viscosity, low humidity sensitivity and high temperature resistance (Steinmann, par.0002).

### ***Response to Arguments***

7. The Declaration under 37 CFR 1.132 filed on June 12, 2009 is insufficient to overcome the rejection of claim 1 based upon Ohkuma et al. (US Patent 5,776,634) and Date et al. (WO 02/48101), as set forth in the last Office action because the Additional



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Examples 1-2 (Sb) are not commensurate in scope with claim 1 of the instant application.

The Additional Examples 1-2 (Sb) use compositions comprising:

- UVR-6105 and BPO-20E, which are cationic-polymerizable compounds with epoxy groups;
- A-BPE-4, ADCP and ATM-4P, which are radical-polymerizable organic compounds with acryl groups;
- I-184 (Irgacure 184) as photoradical polymerization initiator, and
- CPI-101A which is a solution of the compound of formula (I) in claim 1.

These components are claimed in claim 1.

However, the compositions of the Additional Examples 1-2(Sb) also comprise:

- OXT-101, which is a compound with oxetane groups, and
- PTMG-2000SN, which is a polytetramethylene glycol.

These compounds are not comprised in the composition of claim 1 of the instant application.

Due to the fact that the compound OXT-101, PTSMG-2000 SN are not included in the independent claim 1, the Additional Examples 1-2 (Sb) cannot be considered as commensurate with the scope of claim 1.

Also, the Additional Comparative Examples 1-2(P) in the Declaration do not show compositions of the closest example of the prior art of record (Okhuma et al.).

An affidavit or declaration under 37 CFR 1.132 must compare the claimed subject matter with the closest prior art to be effective to rebut a prima facie case of obviousness. *In re Burckel*, 592 F.2d 1175, 201 USPQ 67 (CCPA 1979. Where the comparison is not identical with the reference disclosure, deviations therefrom should be

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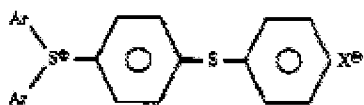
explained, *In re Finley*, 174 F.2d 130, 81 USPQ 383 (CCPA 1949), and if not explained should be noted and evaluated, and if significant, explanation should be required. *In re Armstrong*, 280 F.2d 132, 126 USPQ 281 (CCPA 1960) (deviations from example were inconsequential). (MPEP-716.02(e) [R-2] Comparison With Closest Prior Art)

Therefore, the Declaration under 37 CFR 1.132 is not sufficient to overcome the rejection of claim 1 under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158).

8. Applicant's arguments filed on June 12, 2009 have been fully considered but they are not persuasive.

On pages 5-7 of the Remarks, the applicant argues that the Declaration under 37 CFR 1.132 proves the superiority of the resin composition of the instant application. The examiner's position regarding the Declaration is shown in paragraph 7 above.

On page 7 of the Remarks, the applicant argues that Okhuma et al. teach nine general structures of cationic initiators, including the structure of formula (I)



, wherein Ar may be an aryl group and X<sup>+</sup> may be BF<sub>4</sub><sup>+</sup>, PF<sub>6</sub><sup>+</sup>, AsF<sub>6</sub><sup>+</sup> or SbF<sub>6</sub><sup>+</sup>.

The applicant further argues that this structure encompasses numerous possible compounds and there is no teaching or suggestion in Okhuma of the superiority of any particular anion over any other or of any specific aryl group relative to any other.

Since the initiator of formula (I) is one of nine possible cationic polymerization initiators taught by Okhuma et al., one of ordinary skill in the art would have been motivated to choose it, with a reasonable expectation of success.

Exemplary rationales that may support a conclusion of obviousness include:

- (A) Combining prior art elements according to known methods to yield predictable results;
- (B) Simple substitution of one known element for another to obtain predictable results;
- (C) Use of known technique to improve similar devices (methods, or products) in the same way;
- (D) Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
- (E) “ Obvious to try ” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- (F) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- (G) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. (MPEP 2141.III. RATIONALES TO SUPPORT REJECTIONS UNDER 35 U.S.C. 103)

The examiner would like to show that 7 out of 8 examples of Okhuma (Examples 1-3 and 5-8) show cationic polymerization initiators wherein Ar is a phenyl group.

Therefore, one of ordinary skill in the art would have been strongly motivated to use as cationic polymerization initiator a compound of formula (I) above wherein Ar is a phenyl group.

Okhuma et al. clearly teach that the anion  $X^-$  may be  $SbF_6^-$  (column 10, lines 23-24). Therefore, one of ordinary skill in the art would have been motivated to use as cationic polymerization initiator a compound of formula (I) above wherein Ar is a phenyl group and  $X^-$  is  $SbF_6^-$  (column 10, lines 23-24).

On page 8 of the Remarks, the applicant further argues that a specific photoinitiator for cationic polymerization provides the resin with superior curing selectivity and physical strength and such results would not have been expected based on Okhuma et al.

However, the applicant did not provide any evidence to show that the composition of the instant application provides superior results when compared to the composition of Okhuma et al. Therefore, this argument is not persuasive.

The rejection of claim 1 under 35 U.S.C. 103(a) over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158) is maintained.

On pages 8-9 of the Remarks, the applicant argues the rejection of claims 7-8 under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are from the English equivalent document, US Pg-Pub 2004/0030158) as applied to claim 1 and in further view of Steinmann (US Pg-Pub 2004/0137368).

The applicant argues that it would not have been expected based on the combination of Okhuma and Date to obtain a resin composition with superior properties.

However, the applicant did not provide any evidence to show that the composition of the instant application provides superior results when compared to the composition of Okhuma et al. Therefore, this argument is not persuasive.

The rejection of of claims 7-8 under 35 U.S.C. 103(a) as obvious over Ohkuma et al. (US Patent 5,776,634) in view of Date et al. (WO 02/48101, wherein the citations are

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from the English equivalent document, US Pg-Pub 2004/0030158) as applied to claim 1 and in further view of Steinmann (US Pg-Pub 2004/0137368) is maintained.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANCA EOFF whose telephone number is (571)272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/A. E./

Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795